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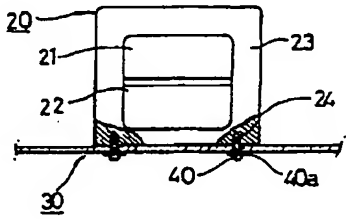
(54) High voltage transformer assembly apparatus of microwave oven

(57) The high-voltage transformer (20) of a microwave oven is directly mounted to a panel (30) of the oven using screws (40) which pass through the panel (30) and into holes in the core (23) of the transformer (20).

FIG. 4



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Description

The present invention relates to a microwave oven comprising a panel, a magnetron for generating microwaves and a high-voltage transformer, having a core, for supplying power to the magnetron, the transformer being mounted to the panel.

A known microwave oven will now be described with reference to Figures 1 and 2.

Referring to Figure 1, a microwave oven 10 comprises a cooking chamber 11 for receiving food to be cooked, a magnetron 12 for supplying microwave radiation to the chamber 11 and a high-voltage transformer 13 for supplying the high-voltage required by the magnetron 12. The transformer 13 is mounted to a lower panel 14 of the oven.

Referring also to Figure 2, the transformer 13 is mounted a bracket 13a which is in turn bolted or screwed to the to the panel 14.

The transformer 13 is comprises a core, a primary winding 15 and a secondary winding 16. The windings 15, 16 are arranged such that the transformer's output voltage is 2100V.

Conventional microwave ovens employ one of two techniques for ensuring that food is cooked evenly. One technique employs a stirrer, comprising a rotating, metal propeller-like structure. In the other technique, the food is rotated on a turntable. The present invention is applicable to microwave ovens irrespective of the technique used to ensure even cooking.

It is an aim of the present invention to simplify the installation of high-voltage transformers in microwave ovens.

An oven according to the present invention is characterised in that the transformer is mounted to the panel by fastening means passing through the panel into said core.

Preferably, the fastening means comprises a plurality of screws. A washer may be used with each screw. Bolts or studs could be used instead of screws.

As a result of the present invention, the number of components used in manufacturing a microwave oven is reduced. The process of manufacture is also simplified.

The abandonment of a mounting bracket for the high-voltage transformer results in improved cooling.

An embodiment of the present invention will now be described, by way of example, with reference to Figures 3 and 4 of the accompanying drawings, in which:

Figure 1 is a sectional view of a conventional microwave oven;

Figure 2 is a perspective view of a conventional high-voltage transformer;

Figure 3 is an exploded perspective view of a tranformer mounting arrangement according to the present invention; and

Figure 4 is a sectional view of the arrangement of Figure 3.

Referring to Figure 3, a high-voltage transformer 20 comprises a core 23, a primary winding 21 and a secondary winding 22. The primary winding 21 and the secondary winding 22 are encompassed by the core 23. The core 23 is provided with four hole 24 for receiving mounting screws 40. A panel 30 of a microwave oven is provided with four holes 31 arranged such that they can be aligned together with the holes 24 in the core 23.

Referring to Figure 4, the transformer 20 is mounted to the panel 30 by screwing screws 40 into the holes 24 in the core 24 through the holes 31 in the panel 30. Washers 40a are positioned between the heads of the screws 40 and the panel 30.

Of course, the holes 24 are positioned and dimensioned to ensure that none of the screws 40 encounters a winding 21,22.

Claims

1. A microwave oven comprising a panel (30), a magnetron for generating microwaves and a high-voltage transformer (20), having a core (23), for supplying power to the magnetron, the transformer being mounted to the panel, **characterized in that** the transformer is mounted to the panel by fastening means (40,40a) passing through the panel into said core.

2. An oven according to claim 1, wherein the fastening means comprises a plurality of screws (40).

3. An oven according to claim 2, wherein a washer (40a) is used with each screw.

4. A high-voltage transformer assembly apparatus of a microwave oven having a high-voltage transformer for an electrical power necessary for operation of a magnetton for supplying electromagnetic waves, the apparatus for being formed with a plurality of fastening holes underneath a core surrounding an external side thereof and for being formed at a bottom panel thereof with a plurality of through holes to correspond to the plurality of fastening holes underneath the core to integrally fix a hig-voltage transformer to the bottom panel by way of fastening means.

5. The apparatus as defined in claim 4, wherein the fastening means fastens the bottom panel and the high-voltage transformer through the media of washers respectively thereto.

6. The apparatus as defined in claim 4, wherein the fastening means are a plurality of bolts.

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FIG. 1

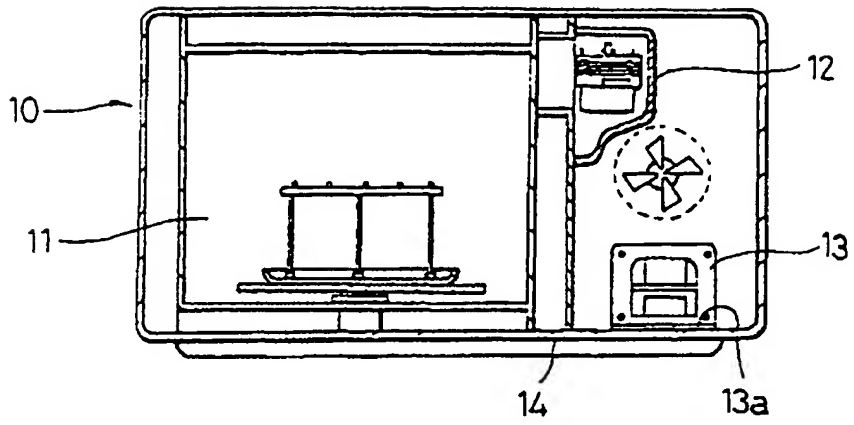


FIG. 2

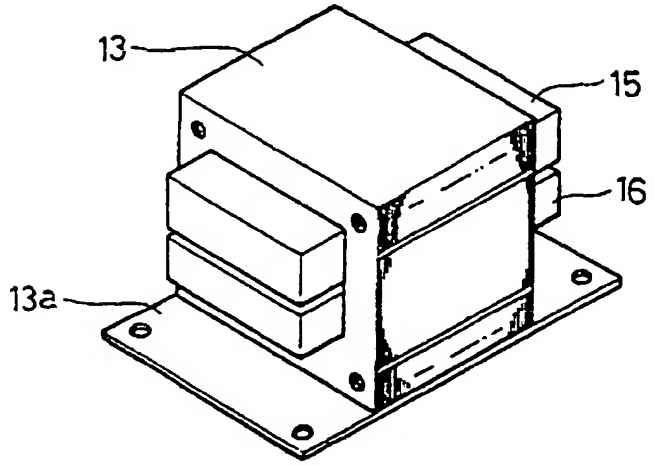


FIG. 3

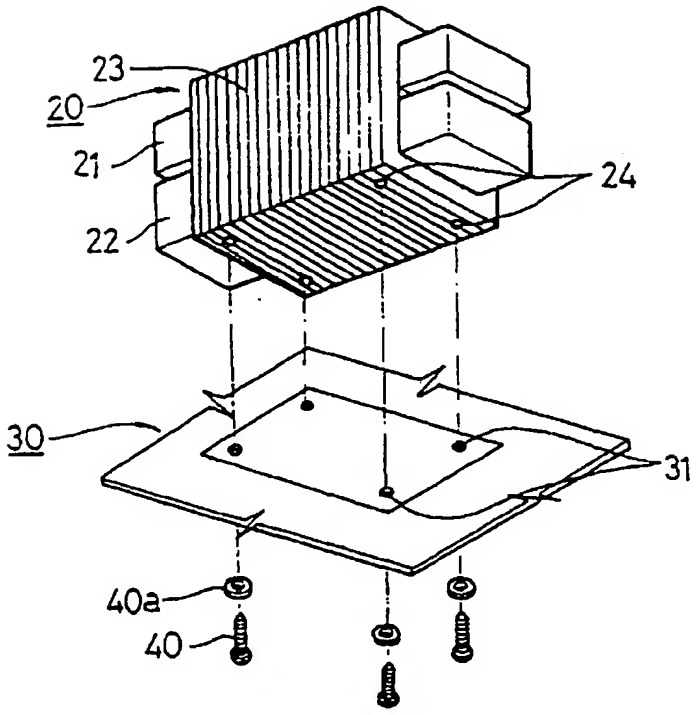
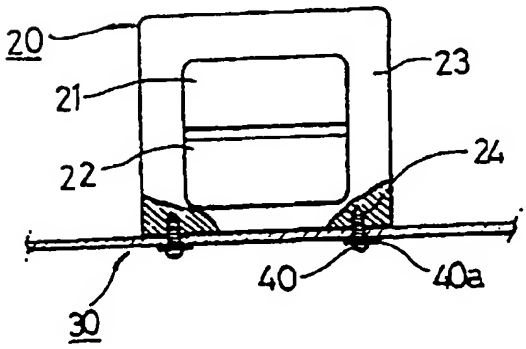


FIG. 4



EUROPEAN PATENT OFFICE

Patent Abstracts of Japan

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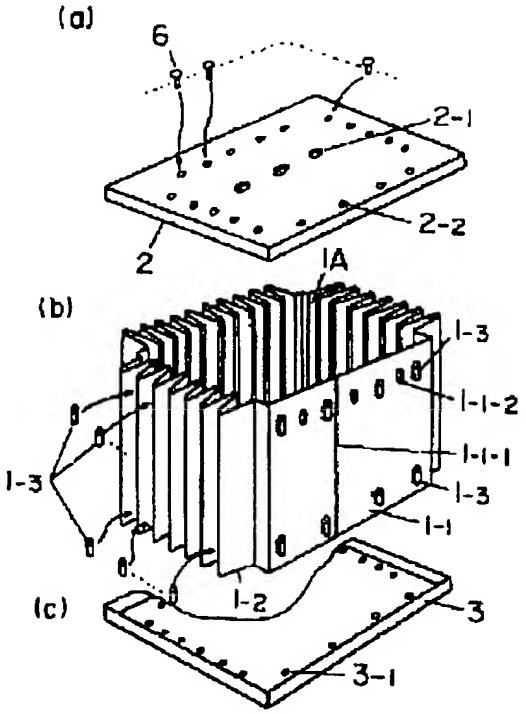
APPLICANT : MATSUSHITA ELECTRIC IND CO LTD;

INVENTOR : MISHIMA KENSHICHIRO;

INT.CL. : H01F 27/02 H01F 27/12

TITLE : CASE OF OIL-IMMERSED TRANSFORMER AND MANUFACTURE THEREOF



ABSTRACT : PROBLEM TO BE SOLVED: To enable the case of an oil-immersed transformer to be manufactured very easily with the least welding by a method, wherein a cylindrical case is provided with a corrugated heat radiating surface as a side face that extends from the upper edge to the lower edge of the case, a cover is provided to the upper edge face of the case, and a base plate is provided to the lower edge face.

SOLUTION: A case 1 is provided with three corrugated heat radiating sides 1-2 which are formed by bending a thin steel plate into wavy forms and a flat side 1-1 which is formed in one piece with the other three sides 1-2 and where bushing insulators are mounted, and the case 1 is welded along a weld line 1-1-1 which extends on the flat side 1-1 in a vertical direction to be formed into a cube. Then, a cover 2 and a base plate 3 are each formed larger than the maximum dimensions of the cylindrical case 1 to be with enough to cover all the edge face of the case 1, and primary bushing insulator mounting holes 2-1 and fastening bolt holes 2-2 are provided to the cover 2. On the other hand, base plate fastening bolt holes 3-1 are provided to the base plate 3.

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EUROPEAN SEARCH REPORT

Application Number
EP 96 30 7672

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	US 4 618 756 A (SCHWADERER JOHN R ET AL) 21 October 1986 * column 3, line 44 - column 4, line 38; figure 5 *	1-6	H05B6/80
A	PATENT ABSTRACTS OF JAPAN vol. 010, no. 058 (E-386), 7 March 1986 & JP 60 210817 A (MATSUSHITA DENKI SANGYO KK), 23 October 1985, * abstract *	1,2,4,6	
A	DE 36 28 563 A (MURR ELEKTRONIK GMBH) 25 February 1988		
A	DE 24 36 067 A (WAASNER B) 5 February 1976		
A	DE 40 36 482 A (WAASNER ELEKTROTECHNISCHE FABR) 21 May 1992		

TECHNICAL FIELDS SEARCHED (Int.Cl.6)
H05B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	3 April 1997	Albertsson, E

CATEGORY OF CITED DOCUMENTS
X : particularly relevant if taken alone
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